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August 2, 1999

Hand Delivery

Magalie Román Salas, Secretary
Federal Communications Commission
Washington, D.C. 20554

Re: MM Docket No. 99-25
Creation of Low Power Radio Service

Dear Ms. Salas:

On behalf of our client, Shockley Communications Corporation ("SCC"), transmitted herewith for filing are an original and nine (9) copies of its **"Comments of Shockley Communications Corporation** in response to the Notice of Proposed Rule Making in the above-referenced Docket.

In its Comments, SCC proposes that, instead of protecting full service FM stations only to the primary service contour for a particular class of license, the Commission's minimum distance separation Tables (Appendix B of the NPRM) should employ distances which provide protection to the predicted 44 dBu F(50,50) contour as the limit of a full service FM station's listenable service area. SCC also applies its proposed standard to the Duluth-Superior radio market (where its three FM stations are located) and quantifies the impact of its alternative standard on the number of LPFM stations that could be allotted compared to the NPRM's proposals. Finally, SCC endorses certain specific concerns and recommendations expressed in the Comments of the National Association of Broadcasters ("NAB") simultaneously filed today

Please direct any communications or inquiries concerning this matter to the undersigned.

Very truly yours,

Jerold L. Jacobs

Jerold L. Jacobs

Enc.

No. of Copies rec'd 0+9
List ABCDE

cc: Paul Gordon (paper copy and 3.5 in. diskette)
Bruce Romano (paper copy only)
Keith A. Larson, Ass't Chief (paper copy only)**(All FCC – By Hand – w/enc.)**

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ORIGINAL

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	MM Docket No. 99-25
	)	
Creation of a Low	)	
Power Radio Service	)	

To: The Commission

COMMENTS OF
SHOCKLEY COMMUNICATIONS CORPORATION

SHOCKLEY COMMUNICATIONS CORPORATION ("SCC"), licensee of Stations KDAL(FM) and KTCO(FM), Duluth, Minnesota, and KRBR(FM), Superior, Wisconsin, by its attorneys, hereby comments on selected issues raised in the Notice of Proposed Rule Making in MM Docket No. 99-25 ("NPRM"), FCC 99-6, released February 3, 1999. *In particular, SCC proposes that, instead of protecting full service FM stations only to the primary service contour for a particular class of license, the Commission's minimum distance separation Tables (Appendix B of the NPRM) should employ distances which provide protection to the predicted 44 dBu F(50,50) contour as the limit of a full service FM station's listenable service area.* In these Comments, SCC also applies its proposed standard to the Duluth-Superior radio market (where its three FM stations are located) and quantifies the impact of its alternative standard on the number of LPFM stations that could be allotted compared to the NPRM's proposals. Finally, SCC endorses certain specific concerns and recommendations expressed in the Comments of the National Association of Broadcasters ("NAB") simultaneously filed today.

I. Introduction

1. The NPRM (¶1) proposes to create two class of low power FM ("LPFM") radio stations – a 1000-watt primary service ("LP1000") and a 100-watt secondary service ("LP100")

– and also seeks comment on whether to establish a third "microradio" FM service which would operate in the range of 1 to 10 watts on a secondary basis.

2. To accomplish this result, the NPRM proposes in Appendix B to establish new minimum distance separations between the proposed classes of LPFM stations and existing full service FM stations. Moreover, the Commission recognizes that the types of new interference protection standards that are adopted will dramatically affect the number of LPFM stations that can be authorized. Hence, the NPRM proposes (¶¶'s 43-45) not to require 3rd-adjacent channel protection to or from any of the three contemplated classes of LPFM stations, and the NPRM (¶¶'s 46-50) leans toward, but does not officially propose, not requiring 2nd-adjacent channel protection to or from any of the three contemplated classes of LPFM stations. Appendix D of the NPRM contains spectrum availability analyses for 60 communities of various sizes throughout the United States, taking into account the proposed distance separations and whether there is no 3rd-adjacent channel interference protection or no 2nd- and 3rd-adjacent channel protection.

II. SCC's Alternative Proposal

3. Even before the Commission reaches the questions of interference protection to 2nd- and 3rd-adjacent channel stations, SCC urges that the Commission should reexamine its assumptions in the NPRM concerning the minimum distance protection to be accorded to full service FM stations. The centerpiece of these Comments is the attached Engineering Statement ("Statement") by Mr. Clarence M. Beverage of Communications Technologies, Inc. The Statement (at 2) sets forth an alternative minimum distance separation standard – protection to the predicted 44 dBu F(50,50) contour of full service FM stations – as the basis for new separation Tables for any LPFM stations.

4. SCC's proposed use of a 44 dBu standard is based upon the extensive body of research accompanying USA Digital Radio Partners' Petition for Rulemaking (RM-9395) to permit the

introduction of digital audio broadcasting in the AM and FM services. In that Petition, the 44 dBu contour is defined as the extent of listenable FM service for the average listener, and SCC urges that this same standard should be adopted as a full power FM station's protected contour, instead of its primary service contour. Importantly, the concept of protecting a station's "existing listening area" and not just its primary service contour is not new and, in fact, is the basis for interference protection in the existing FM Translator Service. See Section 74.1203(a)(3) of the Commission's Rules (FM translator interference defined as impairment of "reception of a regularly used [broadcast] signal...regardless of the quality of such reception").

5. Table I of Mr. Beverage's Statement provides distances to the 44 dBu contour for all full service FM radio classes, along with distances to the associated interfering contours required to build revised Appendix B distance separation Tables. Tables II-IV are minimum distance separation Tables for LP1000, LP100, and microradio, which are proposed by SCC as substitutes for the Tables appearing in Appendix B of the NPRM. Finally, SCC applies its proposed standard to the Duluth-Superior radio market in Tables V-VII. It should be noted that SCC's analysis assumes that 2nd- and 3rd- adjacent channel interference protection is not being provided by any LPFM stations. Obviously, the number of available LPFM channels will drop significantly in SCC's alternative analysis of the Duluth-Superior market if 2nd- or 3rd- adjacent channel protection is required to be provided.

6. Tables V-VII show that if SCC's proposed alternative interference standard is applied to the Duluth-Superior market, fewer LPFM stations can be added to the market, as follows:

Station	**LP1000**		**LP100**		**Micro**	
	FCC	**SCC**	**FCC**	**SCC**	**FCC**	**SCC**
KDAL (Table V)	28	1	47	19	56	31
KTCO (Table VI)	30	2	53	26	54	40
KRBR (Table VII)	31	2	52	25	56	42

Clearly, providing protection to the predicted 44 dBu F(50,50) contour, as SCC proposes, will drastically decrease the number of LPFM stations that could be added in the Duluth-Superior market, with further significant decreases to be expected if 2nd- or 3rd-adjacent channel protection is required to be provided by LPFM stations.

7. While such a result militates against the utility of establishing an LPFM service at all, SCC's objective is not to stifle the development of such a service but rather to ensure that the viability and effectiveness of existing full service FM stations is adequately protected, if the Commission should decide to authorize an LPFM service. In this respect, SCC sharply disagrees with the NPRM's apparent premise that LPFM is so clearly in the public interest that the Commission's existing technical rules must be amended to foster a significant number of such stations, regardless of their interference impact upon existing stations. SCC urges that maintaining the technical/interference integrity of the existing full power FM service is a more important public interest goal than maximizing the number of LPFM stations as an end in itself. Simply stated, the addition of a small number of technically appropriate LPFM stations will have a much greater public interest benefit than adding a larger number of stations that will do technical violence to the FM spectrum. Hence, SCC submits that the paramount public interest warrants Commission adoption of SCC's proposed alternative protection standard, instead of the NPRM's proposal.

III. SCC Endorses NAB Concerns and Recommendations

8. Finally, SCC greatly appreciates the fact that the NAB provided SCC with an early draft of NAB's proposed Comments in this proceeding. SCC has studied that draft and specifically endorses the following concerns and recommendations expressed in the NAB's Comments:

- It is not economically feasible to drop in hundreds of FM stations – low power or not – and expect existing FM broadcasters to be unaffected. If an LPFM service is

established, existing stations (particularly those in smaller markets) may well have a difficult time providing the quality full service that they do today, and further ownership consolidation will occur;

- The Commission faces very significant hurdles in implementing its LPFM proposals in the face of statutory requirements concerning ownership diversity and mandatory auctions. If an LPFM service is established, the stations must be made available to everyone – not just "non-broadcast licensee" owners -- and the licenses must be awarded by auction, absent statutory amendment;

- The continuous growth of diverse radio formats and the emergence of Internet "webcasting" are examples of alternatives to establishing an LPFM service that warrant further Commission policy consideration;

- Rational technical decisionmaking dictates that the Commission should first identify the IBOC DAB standard to be used in the United States before making any significant change in the way that FM stations are allotted;

- NAB's radio receiver study challenges the Commission's assumption that receiver performance has improved so that today's receivers are generally better at rejecting 2nd- and 3rd-adjacent channel interference than radios of the past;

- In weighing whether and how to establish an LPFM service, the Commission should consider all of the evidence, including its own prior spectrum management decisions, before concluding that LPFM interference will be "minimal"; and

- The Commission previously relaxed 2nd- and 3rd-adjacent channel protection criteria in the FM service in the 1940's and then was forced to tighten them due to interference problems. It therefore has a heavy burden to justify reverting to a previously rejected standard. Moreover, the NPRM fails to consider the questions of 2nd- and 3rd-adjacent channel interference from a full power station to a low power station. The NAB's studies suggest that such interference would often be so great that it would make an LPFM station useless.

IV. Conclusion

9. However laudable the establishment of an LPFM service may be, the Commission has a pre-existing public interest obligation to preserve the existing full power FM radio service, which it has been nurturing for some 60 years. The perceived benefits of the proposed LPFM service do not outweigh the Commission's paramount public interest responsibility to provide adequate interference protection to existing FM stations. Therefore, if the Commission establishes an LPFM service, it should adopt technical LPFM rules which do not undermine the

existing full power FM service. SCC's alternative minimum separation standard and the NAB's Comments should assist the Commission in that process.

WHEREFORE, in light of the foregoing, SCC respectfully requests that the Commission should adopt SCC's 44 dBu contour protection proposal and heed its other concerns and recommendations and those of the NAB as it considers whether and how to establish an LPFM service.

Respectfully submitted,

SHOCKLEY COMMUNICATIONS CORPORATION

By _____
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Jerold L. Jacobs

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Its Attorneys

Dated: August 2, 1999

ENGINEERING STATEMENT

PREPARED IN SUPPORT OF COMMENTS IN

MM DOCKET NO. 99-25 RM-9208, RM-9242

CREATION OF A LOW POWER RADIO SERVICE

BY

SHOCKLEY COMMUNICATIONS CORPORATION

DULUTH, MINNESOTA/SUPERIOR, WISCONSIN

JULY 1999

ENGINEERING STATEMENT
PREPARED IN SUPPORT OF COMMENTS IN
MM DOCKET NO. 99-25 RM-9208, RM-9242
CREATION OF A LOW POWER RADIO SERVICE
BY
SHOCKLEY COMMUNICATIONS CORPORATION
DULUTH, MINNESOTA/SUPERIOR, WISCONSIN

JULY 1999

SUMMARY

The following engineering statement has been prepared on behalf of **Shockley Communications Corporation ("Shockley")**, licensee of FM broadcast stations KTCO and KDAL, Duluth, Minnesota, and KRBR, Superior, Wisconsin. **Shockley** wishes to file Comments in the Low Power Radio Service Proceeding concerning Spectrum Priority and Interference Protection Criteria to help ensure that whatever new service may be authorized by the Commission is consistent with protection of existing FM service.

INTERFERENCE PROTECTION CRITERIA

In paragraph 41 of the NPRM, the Commission asks whether a Table of minimum distance separations should be employed and whether the specific values in Appendix B are appropriate. **Shockley** is cognizant that minimum distance separations are administratively convenient and desirable in these days of increased electronic processing. However, the Appendix B distance Table is based on protecting full service stations only to the primary service contour for the particular class of license, i.e., 60 dBu for Class A, and Class C, etc. The use of the primary contour as the protection standard is not consistent with protection of existing radio service[1] as service extends beyond the predicted primary contour in many directions for most FM broadcast stations.

SHOCKLEY PROPOSES SUBSTITUTE TABLES

Shockley believes, as members of the Commission have stated, that a new low power FM service must

[1] See paragraph 112 of NPRM.

protect existing service. To do that, a minimum distance separation Table should employ distances which provide for protection to the predicted 44 dBu F(50,50) contour as the limit of useable service.[2] *Table I*, attached, provides distances to the 44 dBu contour for all full service radio classes, along with distances to the associated interfering contours required to build revised Appendix B distance separation Tables. *Tables II-IV* are minimum distance separation Tables for LP1000, LP100, and microradio classes of FM broadcasting, which are proposed by **Shockley** as substitutes for the Tables appearing in Appendix B. Use of the substitute Tables would more likely result in protection to a full service FM station's listenable service area.

DULUTH/SUPERIOR MARKET RESULTS

How would the adoption of **Shockley's** proposed minimum distance separation standards affect the availability of new LPFM allocations? The answer may be seen for the greater Duluth, Minnesota and Superior, Wisconsin areas by examination of *Tables V-VII*. These Tables represent the results of LPFM allocation studies for points along the 60 dBu contours of the above referenced **Shockley** owned and operated FM stations in the Duluth/Superior radio market. It should be noted that the allocation study results are based on the assumption that there are no LPFM 2nd and 3rd adjacent channel distance separation requirements. The azimuth bearing from the FM station studied, as an example KDAL in *Table V* and the coordinate for the 60 dBu contour at this bearing, appear in column 1. The LP1000 column identifies the channels that could be allotted at the study coordinate for a new LP1000, using the FCC Appendix B minimum separation Table and then the proposed **Shockley** minimum separation Table. It is clear that the number of new stations is limited but that there are still new-station opportunities remaining when the **Shockley** proposed minimum distance separation Tables are used.

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[2] **Shockley** points the Commission to the extensive body of research accompanying USA Digital Radio Partners, L.P. Petition for Rule Making to permit the Introduction of Digital Audio Broadcasting in the AM and FM Broadcast Services RM-9395. Based on USADR's studies (Appendix C, Footnote 4), the 44 dBu F(50,50) contour is defined as the extent of listenable FM service for the average listener.

CONCERNS ABOUT 2ND AND 3RD ADJACENT CHANNEL PROTECTION

In paragraphs 42-50 of the NPRM, the issue of 2nd and 3rd adjacent channel protection is raised. It is noted that potentially available LPFM channels printed in bold italic in *Tables V-VII* are adjacent channels to the station whose contour is being studied. **Shockley** is concerned that the presence of these adjacent channel stations will cause interference within the primary station's listenable service area.

NAB and others are expected to submit substantial adjacent channel receiver test results during the comment period in this proceeding which will substantially aid in assessing the impact of 2nd and 3rd adjacent channel stations. **Shockley** therefore prefers to review this data and to wait for Reply Comments before addressing this matter further.

CONCLUSION

Shockley has presented herein Comments which go to the heart of this proceeding: how to implement a viable new service while protecting the existing service areas of full service FM stations. It is proposed that the "existing listening area" of an FM station be protected and not just its primary service contour. This concept is not new and, in fact, is the basis for the existing FM Translator Service[3]. The protection of existing listening areas may be achieved in great part by adopting the 44 dBu contour as the protected contour and a set of minimum distance separations based on this contour as developed by **Shockley** and fully described herein.

[3] See Section 74.1203(a)(3) of the Rules.

The foregoing was prepared on behalf of **Shockley Communications Corporation** by Clarence M. Beverage of *Communications Technologies, Inc.*, Marlton, New Jersey, whose qualifications are a matter of record with the Federal Communications Commission. The statements herein are true and correct of his own knowledge, except such statements made on information and belief, and as to these statements he believes them to be true and correct.

By _____

Clarence M. Beverage
for Communications Technologies, Inc.
Marlton, New Jersey

SUBSCRIBED AND SWORN TO before me,

this 23rd day of July, 1999,

Esther G. Sperbeck, NOTARY PUBLIC

ESTHER G. SPERBECK
NOTARY PUBLIC OF NEW JERSEY
MY COMMISSION EXPIRES OCT. 15, 2002

TABLE I

DISTANCE TO SERVICE CONTOURS USED IN CREATING MINIMUM DISTANCE SEPARATION TABLES

CLASS	FACILITY ERP/HAAT	DISTANCE TO CONTOUR F(50,50) PROTECTED	44 dBu
A	6 kW/100m	60 dBu - 28.29Km	58.73
B1	25 kW/100m	57 dBu - 44.73Km	73.31
C3	25 kW/100m	60 dBu - 39.07Km	73.31
B	50 kW/150m	54 dBu - 65.05Km	88.60
C2	50 kW/150m	60 dBu - 52.19Km	88.60
C1	100 kW/299m	60 dBu - 72.29Km	111.86
C	100 kW/600m	60 dBu - 91.80Km	137.62
D	0.085 kW/30m	60 dBu - 5.45Km	13.70
LP1000	1 kW/60m	60 dBu - 14.17Km	34.69
LP100	0.1 kW/30m	60 dBu - 5.67Km	14.26
MICRO	0.001 kW/30m	60 dBu - 1.84Km	4.49

DISTANCE TO INTERFERENCE CONTOURS F(50,10)

FOR CLASS	CO-CH 24 dBu	1ST Adj. 38 dBu	2ND Adj. Reserved 64 dBu	2ND/3RD Adj. Commercial 84 dBu
LP1000	117.44	57.15	11.39	3.60
LP100	59.36	21.24	4.49	0.00
MICRO	14.26	6.37	0.00	0.00

DISTANCE FULL SERVICE OR LPFM TO LPFM F(50,10)

FOR CLASS	CO-CH 40 dBu	1ST Adj. 54 dBu	2ND Adj. Reserved 80 dBu	2ND/3RD Adj. Commercial 100 dBu
A	86.65	43.73	9.1	2.77
B1,C3	113.61	60.16	12.86	4.06
C2,B	137.69	78.09	19.94	5.97
C1	171.84	104.96	33.66	10.11
C	197.72	136.54	50.38	13.70
D	17.87	7.72	1.76	0.00
LP1000	50.81	21.16	4.54	0.00
LP100	18.72	8.05	1.84	0.00
MICRO	5.67	2.57	0.00	0.00

TABLE II
CLASS LP1000
Assuming 1000 watt effective radiated power (ERP)
at 60 meters antenna height above terrain (HAAT)
60 dBu F (50,50) protected contour extends 14.2 km

MINIMUM DISTANCE SEPARATION (KM) NECESSARY TO :
CAUSE NO OVERLAP/RECEIVE NO OVERLAP

Channel Class	co-	1st	2nd - reserved band	2nd/3rd commercial band	IF
A	176/101	116/58	70/23	63/17	7
C3	190/128	130/74	84/27	77/18	9
B1	190/128	130/74	84/27	77/18	9
C2	206/152	146/92	100/34	93/20	13
B	206/152	146/92	100/34	93/20	13
C1	229/186	169/119	123/48	116/24	20
C	255/212	195/151	149/64	142/28	28
D	131/32	71/22	25/16	18/14	4
Other LP1000	65	35	19		

TABLE III
CLASS LP100
Assuming 100 watt effective radiated power (ERP)
at 30 meters antenna height above terrain (HAAT)
60 dBu F (50,50) protected contour extends 5.2 km
MINIMUM DISTANCE SEPARATION (KM) NECESSARY TO :
CAUSE NO OVERLAP/RECEIVE NO OVERLAP

Channel Class	co-	1st	2nd - reserved band	2nd/3rd commercial band	IF
A	118/93	80/50	63/15	59/9	7
C3	132/120	94/66	77/19	73/10	9
B1	132/120	94/66	77/19	73/10	9
C2	148/144	110/84	93/26	89/12	12
B	148/144	110/84	93/26	89/12	12
C1	171/178	133/111	116/40	112/16	20
C	197/204	159/143	142/56	138/20	28
D	73/24	35/13	18/8	14/6	4
Other LP1000	25	14	8		

TABLE IV
MICRORADIO CLASS
Assuming 1 watt effective radiated power (ERP)
at 30 meters antenna height above terrain (HAAT)
60 dBu F (50,50) protected contour extends 1.8 km
MINIMUM DISTANCE SEPARATION (KM) NECESSARY TO :
CAUSE NO OVERLAP/RECEIVE NO OVERLAP

Channel Class	co-	1st	2nd - reserved band	2nd/3rd commercial band	IF
A	73/89	65/46	59/11	59/5	5
C3	87/116	79/62	73/15	73/6	7
B1	87/116	79/62	73/15	73/6	7
C2	103/140	95/80	89/22	89/8	10
B	103/140	95/80	89/22	89/8	10
C1	126/174	118/107	112/36	112/12	18
C	152/200	144/139	138/52	138/16	26
D	28/20	20/10	14/4	14/2	2
Other MICRO	8	5			

TABLE V
KDAL CH 239C1 100 kW AND 245m HAAT
DULUTH, MINNESOTA
JULY 1999

Study	Coordinates	LP1000		LP100		Micro	
		FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.
0°	47-17-10 92-07-15	232, 296, 258, 252, 284, 266	----------	280, 228, 279, 232, 258, 296, 252, 284	258, 252	291, 280, 228, 279, 232, 296, 258 ,252	279, 232, 296, 258, 252
45°	47-13-12 91-29-02	242, 258, 232	----------	222, 279, 266, 231, 229, 296, ***242***, 258	266, ***242***	222, 279, 266, 231, 229, 296, ***242***, 258	266, ***242***, 258
90°	46-47-07 91-06-27	279, 249, 271, 231, 293, 292	231	223, 288, 261, 233, 279, 249, 231, 271	223, 288, 261, 233, 279, 231, 271	223, 288, 261, 233, 279, 249, 231, 271, 280, 253, 251	280, 223, 288, 261, 233, 279, 249, 231, 271
135°	46-18-14 91-25-26	288, 293, 280, 257	----------	288, 293, 280, 257	288, 280	261, 288, 293	261, 288
180°	46-06-01 92-07-15	280, 261	----------	280, 261	----------	257, 228, 232, 280, 261	280, 261
225°	46-21-32 92-44-15	280	----------	283, 231, 261, 259, 257, 279	279	283, 231, 261, 259, 257, 279, 222, 293, 249	249, 257, 279
270°	46-47-07 92-53-09	***237***	---------	293, 291, ***237***, 280	***237***	252, 293, 291, ***237***	***237***
315°	47-07-55 92-37-32	284, 233, 265, 253, 267	----------	258, 284, 233, 280, 252, 265, 253	258, 284, 265, 253	228, 295, 258, 284, 233, 280, 252, 265	258, 284, 233, 280, 252, 265

TABLE VI
KTCO CH 255C1 100 kW and 183m HAAT
DULUTA, MINNESOTA
JULY 1999

Study	Coordinates	LP1000		LP100		Micro	
		FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.
0°	47-11-10 92-06-59	***252***, 279, 284, ***258***, 266	----------	296, 232, 280, ***252***, 284, ***258***, 279	***252***, ***258***, 279	228, 296, 232, 280, ***252***, 284	296, 232, 280, 252, 284
45°	47-10-50 91-32-41	242, ***258***, 232	----------	231, 229, 296, 266, 242, 279, ***258***	266, 242	280, 231, 229, 296, 266, 279, 242, ***258***	266, 279, 242, 258
90°	46-47-27 91-09-54	280, 279, 249, 261, 233, 271, 292, 231, 293	231	***253***, 251, 223, 288, 280, 279, 249, 261, 233, 271, 231	288, 280, 279, 261, 233, 271, 231	***253***, 251, 223, 288, 280, 279, 249, 261, 233, 271, 231	280, 223, 288, 279, 249, 261, 233, 231, 271
135°	46-19-57 91-27-10	293, ***257***, 280	----------	261, 288, 293	261, 288	261, 288, 293	261, 288
180°	46-09-14 92-06-59	280, 261	---------	257, 232, 280, 261	261	***257***, 232, 280	***257***, 232, 280
225°	46-24-33 92-40-19	279, 257	----------	249, 279, ***257***	279	231, 261, 259, 249, 279, ***257***	249, 279, ***257***
270°	46-47-27 92-42-57	***257***	***257***	279, 237, 293, 291, ***252***, 280, ***257***	279, 237, ***257***	266, 279, 237, 293, 291, ***252***, 280, ***257***	266, 279, 237, ***252***, 280, ***257***
315°	47-03-16 92-30-00	265, 233, ***258***, 267, ***253***	----------	228, 279, 266, 284, 280, 265, 233, ***258***, ***252***, 267, ***253***	279, 266, 284, ***258***, ***252***, 267, ***253***	295, 228, 279, 266, 284, 280, 233, 265, ***258***	228, 279, 266, 284, 280, 233, 265, ***258***

TABLE VII
KRBR CH273C1 100 kW AND 183m HAAT
SUPERIOR, WISCONSIN
JULY 1999

Study	Coordinates	LP1000		LP100		Micro	
		FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.	FCC Sep.	Prop. Sep.
0°	47-10-44 92-07-09	252, 284, 279, 258, 266	----------	296, 232, 252, 280, 284, 258, 279	252, 258, 279	228, 296, 232, 252, 280, 284	296, 232, 252, 280, 284
45°	47-10-44 91-32-51	242, 258, 232	----------	231, 229, 296, 266, 242, 279, 258	266, 242	280, 231, 229, 296, 266, 242, 279, 258	266, 242, 279, 258
90°	46-47-21 91-10-04	280, 279, 249, 261, 233, ***271***, 292, 231, 293	231	280, 279, 249, 261, 233, ***271***, 231, 253, 251, 288, 223	288, 280, 279, 261, 233, ***271***, 231	253, 251, 280, 223, 288, 279, 249, 261, 233, 231, ***271***	280, 223, 288, 279, 249, 261, 233, 231, ***271***
135°	46-19-31 91-26-51	288, 293, 257, 280	----------	288, 293	288	261, 288, 293	261, 288
180°	46-09-18 92-07-09	280, 261	----------	257, 232, 280, 261	261	257, 232, 280	257, 232, 280
225°	46-25-17 92-39-17	279, 257	----------	249, 279, 257	279	291, 261, 259, 231, 249, 279, 257	291, 249, 279, 257
270°	46-47-21 92-43-22	257	257	279, 237, 293, 291, 252, 280, 257	279, 237, 257	266, 279, 237, 293, 291, 252, 280, 257	266, 279, 237, 252, 280, 257
315°	47-02-30 92-29-13	265, 233, 258, 267, 253	----------	265, 233, 258, 267, 253, 295, 228,279, 266, 280, 284	279, 266, 284, 258, 252, 267, 253	***271***, 295, 228, 279, 266, 284, 280, 265, 233, 258	***271***, 228, 279, 266, 284, 280, 265, 233, 258